

WHAT IS CLAIMED:

1. An electrospray device comprising:
 - a tube having a passage for conducting fluids through the tube and connecting an entrance orifice and an exit orifice;
 - a first ring electrode circumscribing the tube to impart a first potential wherein the tube exit orifice is substantially coplanar with or protrudes through a plane defined by the ring electrode; and
 - a second electrode to impart a second potential, wherein the first and the second electrodes are positioned to define an electric field.
2. The electrospray device according to claim 1, wherein the second electrode is positioned to apply potential to the fluid.
3. The electrospray device according to claim 1, wherein the first ring electrode is movable relative to the tube exit orifice.
4. The electrospray device according to claim 1, wherein the first ring electrode is equipped to vary the first potential.
5. A system for processing droplets/sprays of fluid comprising:
 - the electrospray device according to claim 1 and
 - a device positioned to receive droplets/sprays of fluid from the exit orifice of the tube of said electrospray device.
6. The system according to claim 5, wherein the device is a mass spectrometry device.
7. The system according to claim 5 further comprising:
 - a counter electrode coupled to the device to apply a third potential to the device.

8. The system according to claim 5, wherein the first ring electrode is movable relative to the tube exit orifice.

9. The system according to claim 5, wherein the first ring electrode is equipped to vary the first potential.

10. A method of mass spectrometric analysis comprising:
providing the system according to claim 5;
passing a fluid into the entrance orifice, through the tube, and through the exit orifice under conditions effective to produce an electrospray; and
passing the electrospray into the mass spectrometry device, whereby the electrospray is subjected to a mass spectrometric analysis.

11. A method of generating an electrospray comprising:
providing an electrospray device according to claim 1;
passing a fluid into the entrance orifice, through the tube, and through the exit orifice;
applying a first potential to the first ring electrode; and
applying a second potential to the fluid through the second electrode,
wherein the first and the second electrodes are positioned to define an electric field,
whereby the fluid is discharged from the exit orifice in the form of an electrospray.

12. A method according to claim 11, wherein a fluid voltage/ring voltage ratio is greater than approximately 2.

13. A method according to claim 11, further comprising subjecting the electrospray to a mass spectrometry analysis.

14. A method of generating droplets comprising:
providing an electrospray device according to claim 1;
passing a fluid into the entrance orifice, through the tube, and through the exit orifice;
applying a first potential to the first ring electrode; and

applying a second potential to the fluid through the second electrode, wherein the first and the second electrodes are positioned to define an electric field, whereby the fluid is discharged from the exit orifice in the form of droplets.

15. A method according to claim 14, wherein a fluid voltage/ring voltage ratio is less than approximately 2.

16. A system for producing droplets/sprays of fluid comprising:

the electrospray device according to claim 1 and

a device positioned to discharge fluid into the entrance orifice of the tube of the electrospray device.

17. The system according to claim 16, wherein the device is a liquid chromatography device.

18. An electrospray device comprising:

a substrate having an injection surface and an ejection surface, wherein the substrate comprises:

an entrance orifice on the injection surface;

an exit orifice on the ejection surface;

a channel extending between the entrance orifice and the exit orifice;

a recess extending into the ejection surface, thereby defining a nozzle on the ejection surface; and

a voltage application system comprising:

a first ring electrode circumscribing the nozzle to impart a first potential wherein the nozzle is substantially coplanar with or protrudes through a plane defined by the ring electrode to impart a first potential to said substrate and

a second electrode to impart a second potential, wherein the first and the second electrodes are positioned to define an electric field.

19. The electrospray device according to claim 18, wherein the injection surface, the ejection surface, and the channel extending between the entrance orifice on

the injection surface and the exit orifice on the ejection surface contain an insulating layer upon which electrodes can be placed.

20. The electrospray device according to claim 18 wherein the second electrode is positioned to apply potential to the fluid.

21. The electrospray device according to claim 18, wherein the first ring electrode is movable relative to the tube exit orifice.

22. The electrospray device according to claim 18, wherein the first ring electrode is equipped to vary the first potential.

23. A system for processing droplets/sprays of fluid comprising:

the electrospray device according to claim 18 and

a device positioned to receive droplets/sprays of fluid from the exit orifice of the tube of said electrospray device.

24. The system according to claim 23, wherein the device is a mass spectrometry device.

25. The system according to claim 23 further comprising:
a counter electrode coupled to said device to apply a third potential to the device.

26. The system according to claim 23, wherein the first ring electrode is movable relative to the tube exit orifice.

27. The system according to claim 23, wherein the ring electrode is equipped to vary the first potential.

28. A system for producing droplets/sprays of fluid comprising:

the electrospray device according to claim 18 and

a device positioned to discharge fluid into the entrance orifice of the tube of said electrospray device.

29. The system according to claim 28, wherein the device is a liquid chromatography device.